AMENDMENTS

In Claim 76, line 8 of the claim, insert -- independently -- before "determine."

In Claim 84, line 2 of the claim, insert -- from video stream image data -- after "images."

In Claim 96, line 2 of the claim, insert – independently -- before "determine."

REMARKS

Claims 50-97 are pending. Claims 76, 84 and 96 are amended.

Applicant wishes to thank Examiner Tran for the time spent in a telephonic interview with the undersigned on September 7, 2000. The basis for the rejection of Claim 50 was discussed, specifically the combination of elements of Cooper et al., that the Examiner stated met Applicant display input processor (DIP). The undersigned also asked how such a combination might function as such pertains to the Examiner's rejection of Claim 84. The undersigned also asked for clarification of the rejection of Claim 97 as the portion cited in support does not appear to the undersigned to be relevant to the rejection. The Examiner stated that it was preferred that such clarification be in writing at a later date. In view of this, the undersigned stated that several portions of the response would repeat the request for clarification and

should not be treated as unresponsive. The Examiner agreed. No agreement was reached on any of the rejections, however the undersigned responded to the Examiner's request for clarification of an insertion at page 6, line 12 which was not properly specified. The undersigned advised the Examiner that no request for an insertion at such a page had been made, but Applicant did direct the insertion of the parenthetical phase "(not shown)" at page 16, line 12, be made immediately after the word "tuner" that appears on such line.

Claim Rejections under 35 U.S.C. §103(a):

Cooper et al. in view of Szeliski et al.

Claims 50-51, 53-56, 59-63, 65-67, 74-75 and 84-94 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper et al. (U.S. Patent 5,920,688 "hereinafter "Cooper") in view of Szeliski et al. (U.S. Patent 6,044,181 hereinafter "Szeliski"). Applicant traverses.

The Examiner states that Cooper discloses all of the subject matter of Claim 50, and specifically that the limitation of the DIP is met by modem 87, parallel adapter 76 and network adapter 85, citing to col. 6, lines 7-40. Despite the Examiner's omission of any explanation as to how such devices "meet Applicant's DIP," as claimed, Applicant DISAGREES. Referring to col. 6 at lines 7-8, Cooper teaches that parallel adapter 76 is for outputting data in parallel to external devices, an exemplary device being printer 20. At lines 18-30, Cooper teaches that network adaptor 85 and modem 87 are for facilitating communication with other data processing systems. Network

adapter 85 is specifically identified as being for connecting system 10 to a computer network, an exemplary network being a LAN connected to the network port. And modem 87 is identified for providing modulation and demodulation of analog data communicated over a telecommunications line.

In contrast, Applicant's Claim 50 recites, in pertinent part, "[a]n image processing apparatus for receiving bitstream data and processing said bitstream data to provide video stream image data to a display device," which is accomplished in part utilizing "a display input processor (DIP) ... comprising an input data connector and a first plurality of processing modules configured to receive bitstream data input and reconstruct said input to generate DIP outputs." Applicant respectfully asserts that the Examiner's combination of the three devices of Cooper et al., two that provide data I/O from other systems, (modem 87 and network adaptor 85), and one for data output to a printer (parallel adapter 76), CANNOT teach or even suggest Applicant's DIP, as claimed. This as none of such devices provide for processing data for reconstructing a data input both spatially and temporally into a data output suitable for a display output processor (see, page 14, line 24 - page 15, line 1). The Examiner is reminded that in considering whether or not a claim is obvious under 35 U.S.C. §103, that the claimed invention as a whole must be considered. Such is specifically directed by M.P.E.P. §2141.02, citing to *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983), "[i]n determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves

would have been obvious, but whether the claimed invention as a whole would have been obvious." Thus Applicant cannot see any manner in which the three devices of Cooper can be put forth by the Examiner as meeting Applicant's DIP. Hence Applicant asserts, for this reason alone, that the rejection of Claim 50, as well as Claims 51, 53-56, 59-63, 65-67 and 74-75 which depend therefrom, is incorrect and must be withdrawn.

In a manner analogous to the DIP, the Examiner picks several devices of Cooper, specifically cache controller 28, math coprocessor 27, bus control timing 38, buffer 32 and cache 30, and states that such meet the DOP without any explanation. Again, Applicant DISAGREES. Referring to Cooper at col. 4, lines 22-31, it is taught that math coprocessor 27, cache controller 28 and cache memory 30 are coupled to a CPU local bus 25. At lines 32-36 Cooper further teaches that buffer 32 is coupled to local bus 25 to provide communication between such bus and a system bus 34. Such system bus 34 is connected to a bus control and timing unit 38. Thus local bus 25 is isolated from the system bus 34 to allow for enhanced communication between the CPU and peripherals such as cache 30 and coprocessor 27 which serve to enhance CPU efficiency and throughput.

Applicant's Claim 50 additionally recites, in pertinent part, "a display output processor (DOP) ... comprising a second plurality of processing modules configured to process said DIP outputs for generating DOP outputs, said second plurality comprising a geometric transformation (GT) module and a post GT filtering module." Referring to page 14, lines 19-21, Applicant teaches that

the DOP 230, DIP 210 and buffer memory 240 are all coupled to a common databus 250. In contrast, the elements of Cooper selected by the Examiner to "meet the DOP" are NOT coupled to a common data bus, but rather some to local bus 25 and others to system bus 34. In addition, referring back to the elements of Cooper the Examiner alleges "meet the DIP," it can be seen in Cooper's Fig. 2 that such elements are all coupled to yet another bus, planar I/O bus 68. Thus Applicant respectfully asserts that when the invention recited in Claim 50 is considered as a whole, it is incontrovertible that the elements of Cooper selected by the Examiner do not teach or even suggest Applicant's DOP. Hence Applicant asserts, for this additional reason alone, that the rejection of Claim 50, as well as Claims 51, 53-56, 59-63, 65-67 and 74-75 which depend therefrom, is incorrect and must be withdrawn.

The Examiner admits that Cooper does not disclose the geometric transformation module recited in Applicant's Claim 50. However, the Examiner states that Szeliski, at col. 9, lines 9-29 teaches such an apparatus and that it would have been obvious to incorporate the module of Szeliski with Cooper to "construct and render panoramic mosaic images" (Office Action at page 4, line 3). Applicant DISAGREES. It is well established that for a combination of art such as Cooper and Szeliski to be made, there must be some suggestion for the combination, either explicitly or implicitly, in the art itself (M.P.E.P. §2143.01). Applicant respectfully asserts that such is not evident between Cooper and Szeliski. Rather Cooper teaches a method for manipulating only the orientation of an output image sent to an output device

such as a printer, and that while such manipulation might be considered a geometric transformation, such transformations of Cooper do not encompass those of Szeliski or the transformations of Applicant's invention. Szeliski teaches a method using focal length estimation to align plural overlapping images to construct an image mosaic (see, Abstracts of both Cooper and Szeliski). To accomplish such a construct, Szeliski teaches a geometrical transformation method that is directed to aligning a plurality of images properly to provide a seamless image mosaic. In contrast, Cooper rotates a single image to produce an output of such image having a different rotational orientation, such is shown in Figs. 5A-5D.

Applicant represents that Cooper's need for geometrical transformations (see, col. 2, lines 2-4) is the equivalent of a need for a small fence around his house to improve property values, while the geometrical transformations Szeliski teaches for the seamless combination of multiple images are the equivalent of building a full scale version of the Great Wall of China around the house. It follows then that where there is no need for the Great Wall, there can be no motivation in the cited art, or for that matter any where else, for such a combination. Since this combination is one basis of the Examiner's rejection under §103, such a combination is in error and must be withdrawn. As Claims 51, 53-56, 59-63, 65-67 and 74-75 depend from Claim 50, for at least the same reason, the combination of Cooper with Szeliski is also improper and hence must be withdrawn.

Turning to Claim 84, the Examiner states that the method of Claim 84 is rejected for the same reasons as discussed in Claim 50. Applicant DISAGREES and refers to the remarks presented above which detail why the elements identified by the Examiner as meeting the DIP and/or the DOP cannot be properly put forth as meeting the standard required for a rejection of the apparatus claims under §103. In addition, Applicant remarks that Claim 84 is directed to a method and as such has limitations that refer to, for example, "processing said received bitstream information to generate DIP outputs." Since the Examiner's rejection of apparatus Claim 50 gave no indication as to how the identified elements could meet DIP 210 and/or DOP 230, it is not clear how such elements could accomplish the recited method of Claim 84. This is especially relevant as Applicant's invention is directed to forming video stream images where both Cooper and Szeliski are not directed to forming such video streams. Hence Applicant respectfully asserts that the Office Action lacks the specificity required for Applicant to make a more thorough response to the Examiner's rejection of method Claims 84-94, and therefore requests clarification. None the less, Applicant asserts that for at least the above argument, the rejection of Claim 84 is incorrect and must be withdrawn. The rejection of Applicant's Claims 85-95, which depend from Claim 84, is then necessarily also in error and also must be withdrawn.

Szeliski further in view of Frankenbach

Claims 76-83 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski and further in view of Frankenbach (U.S. Patent No. 4,894,653). Applicant traverses.

With regard to Claim 76, the Examiner states that Szeliski discloses all claimed subject matter and specifically a geometric transformation (GT) module coupled to a display device. Applicant DISAGREES. As previously remarked, Szeliski teaches a "method for aligning plural overlapping images with one another for constructing an image mosaic" (Abstract). The plural images of Szeliski are generated by, for example, panning or otherwise moving a camera and recording a series of images during such panning. Szeliski states that prior art methods create cylindrical or even spherical maps from the recorded images and then use such maps to create a virtual environment. The method of the patent discloses how to avoid using such cylindrical or spherical maps. Key to Szeliski's method is the method of geometrical transformation that is employed and discussed at length in relation to at least Figs. 11 and 18.

While both Applicant and Szeliski employ methods for transforming image data and while both disclose that such methods transform some characteristics of the image data in a geometrical manner, such methods are as radically different as the different results to which each is directed. Applicant's claimed invention is directed to providing video stream image data to a display device for viewing such stream. Szeliski, on the other hand is directed to providing a seamless image mosaic, that is to say an essentially virtual image

that can be employed to represent what a viewer would see while looking at a real environment. An example of such an image mosaic is shown by Szeliski at Fig. 38. Since the image mosaic of Szeliski is generally intended to be a 3D rendering using standard 3D graphics APIs and model formats, each portion of the image must look as if viewed from the same physical position, the viewer's eyes, to have such an effect. Thus the geometrical transformation disclosed by Szeliski is directed to such an end by performing transformations on those pixels of the individual images that are used to form the image mosaic where such pixels overlap. Thus a second image that has an overlap portion with a first image is subjected to a transformation matrix to improve registration between overlapped pixels (col. 14, lines 46-60). Szeliski also performs transformations that adjust the apparent focal length (col. 16, line 34 ff), converge ray directions of pairs of patches or overlaid image portions (col. 24 lines 11-44) and compensate for such effects as camera movement, radial distortions and the like (col. 24, line 48 ff). As can be seen, none of the transformations disclosed by Szeliski are directed to forming video image stream data.

In contrast, Applicant provides video image stream data and a GT module 404 configured to provide the transformation processing needed for such stream data. Such processing is described in the specification at page 28, line 20 to page 36 line 9. Thus Applicant respectfully asserts that despite Szeliski referring to geometrical transformations, such processing therein is distinct from the processing provided by Applicant's GT module 404 and

recognition of such is obvious if Applicant's invention is considered as a whole as directed by M.P.E.P. §2141.02. Applicant respectfully asserts that only by not taking §2141.02 into account and thus evaluating an individual module or process of the claimed invention separately can a result such as the instant rejection occur. Hence Applicant asserts, for this reason alone, that the rejection of Claim 76, as well as Claims 77-83 which depend therefrom, is incorrect and must be withdrawn.

The Examiner admits that Szeliski does not disclose the temporal gamma processing (TGP) module recited in Applicant's Claim 76. However, the Examiner states that Frankenbach, at col. 3, lines 13-55 discloses a TGP module for generating video signals used to determine an output intensity value for each color component output to a display device. Applicant DISAGREES.

Claim 76 recites, in pertinent part, "said TGP module configured to independently determine an output intensity value for each color component." This is further defined in the specification at page 45, lines 6-7, which state that "TGP 412, processing each R, G, and B color component independently for each pixel." In contrast, Frankenbach teaches that at each address location in the color look-up tables 46, a fifteen-bit color word is stored (col. 4, lines 54-55), this word having intensity values for all three colors. The fifteen-bit color word is divided into three five-bit final color words 52 and not converted to an actual R, G, B value until converted by a DAC (col. 5, lines 9-18) immediately prior to display. Therefore Applicant asserts that Frankenbach does not teach or even suggest the TGP processing of Applicant's

Claim 76. It follows then that for this additional reason the rejections of Claim 76 and of Claims 77-83, which depend therefrom, is in error and must be withdrawn.

Finally, Applicant asserts that neither Szeliski or Frankenbach offer any motivation for the combination suggested by the Examiner. Szeliski teaches constructing an image mosaic where individual images are overlapped in part to form the mosaic. Frankenbach teaches an early method for providing a high resolution "flicker-free" display by writing a display screen to a bit-mapped memory array and subsequently transferring the "formed" image from the memory array to the display. As Szeliski seems to have no reason for such a high resolution display and as processing speed is much enhanced from the time of the Frankenbach patent, alternate methods of writing display screens that do not require the amount of memory of Frankenbach are available. Hence, for this additional reason, Applicant asserts that the rejection of Claims 76-83 is in error and must be withdrawn.

Cooper in view of Szeliski and further in view of Kitamura et al.

Claims 64 and 72 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper in view of Szeliski as applied to claim 50 above, and further in view of Kitamura et al. (U.S. Patent 5,936,628, hereinafter "Kitamura"). Applicant traverses.

The Examiner essentially states that the combination of Cooper and Szeliski disclose all of the features of the Claims 64 and 72 except for

providing where such module is configured to use texture mapping (64) and simultaneously receive multiple video streams (72). Applicant DISAGREES. As both claims depend from Claim 50, Applicant reasserts the remarks presented with respect to such claim that Cooper and Szeliski do not disclose all the features of such independent claim. It follows then that such combination cannot disclose the features of Claims 64 and 72 derived from Claim 50. In addition, as Kitamura is not put forth to overcome these deficiencies and as Kitamura does NOT in fact overcome these deficiencies, Applicant asserts that the combination of Cooper, Szeliski and Kitamura does not meet the requirement for a rejection under §103 and such rejection must be withdrawn. Furthermore, Applicant asserts that Kitamura does not teach or even suggest the specific limitations of Claims 64 and 72 as alleged by the Examiner.

Specifically, Claim 64 recites, in pertinent part, that the "[GT] module is configured to use texture mapping to perform transitions for multi-picture displays." Claim 72 recites, in pertinent part, an apparatus "configured to receive multiple video streams and process such streams." At col. 7, lines 28-34, the specific portion of Kitamura the Examiner cites in support of Kitamura's disclosure, it is only stated that display unit 4 is for displaying 3D model shapes obtained by the system and that display unit 4 is of the multiple window type. Such disclosure is silent on a GT module configured to use texture mapping to perform transitions and on the ability of such system to receive multiple video streams and process such streams. Therefore for this

additional reason Applicant asserts that the rejection of Claims 64 and 72 is in error and must be withdrawn.

Cooper in view of Szeliski and further in view of Sporer et al.

Claims 58 and 67-70 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper in view of Szeliski as applied to claim 50 above, and further in view of Sporer et al. (U.S. Patent 5,883,670, hereinafter "Sporer"). Applicant traverses.

The Examiner essentially states that the combination of Cooper and Szeliski disclose all of the features of the Claims 58 and 67-70 except for providing a compressed bitstream. Applicant DISAGREES. As both claims depend from Claim 50, Applicant reasserts the remarks presented with respect to such claim that Cooper and Szeliski do not disclose all the features of such independent claim. It follows then that such combination cannot disclose the features of Claims 58 and 67-70 derived from Claim 50 and that any rejection based on such an allegation is in error and must be withdrawn.

In addition, the Examiner states that Sporer teaches a computer system having a video encoder and suggests that it would be obvious to combine such encoder technology with Cooper to reduce the video signal bandwidth and storage capacity required by Cooper. Again Applicant DISAGREES. While Applicant agrees that it is generally advantageous to reduce the required video bandwidth and storage capacity of a computer system, such a need is neither suggested nor obvious from the teachings of Cooper. Rather Cooper teaches

a process for rotating images and outputting such rotated images to a display device such as a printer. Performing this rotation at all times requires real data and not compressed or encoded data. To provide such compressed or encoded data would only add to the processing burden of the system's CPU which is an obvious DISADVANTAGE. Furthermore Cooper neither discloses or suggests that the rotated image is derived from a bitstream. Rather Cooper implies that such image data is generally stored on a disk storage medium by an application before the transformation is begun (col. 7, lines 1-30). Thus for this additional reason, that there is no motivation supplied by the cited art for such a suggested combination, Applicant again asserts that the rejection of Claims 58 and 67-70 is in error and must be withdrawn.

Cooper in view of Szeliski and further in view of Frankenbach

Claims 52 and 96-97 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper in view of Szeliski and further in view of Frankenbach. Applicant traverses.

The Examiner essentially states that Cooper and Szeliski disclose all of the features of Claims 52 and 96-97 except for the specific features recited in such dependent claims. Applicant DISAGREES. As Claim 52 depends from Claim 50 and Claims 96-97 depend from Claim 84, Applicant reasserts the remarks presented with respect to such claims, that Cooper and Szeliski do not disclose all the features of such independent claims. It follows then that the combination of Cooper and Szeliski cannot disclose the features of Claims 52

and 96-97 derived from Claims 50 and 84 and that any rejection based on such an allegation is in error and must be withdrawn.

With regard to Claim 52, the Examiner suggests that it would have been obvious to incorporate the bit mapped memory arrays of Frankenbach with the combination of Cooper and Szeliski to improve the display quality of such a combination. Applicant asserts that such a combination at the time of Applicant's invention would NOT be obvious. As Applicant has previously remarked, the method and apparatus of Frankenbach is old technology that was required for a high resolution display at a time when processor speed was insufficient to so provide. At the time of Applicant's invention, however, such a limitation imposed by processor speed had been eliminated and more efficient methods than providing bit mapped memory arrays in the manner of Frankenbach were in use for such high resolution displays. Thus it is inconceivable that one of ordinary skill in the art would make such a combination. It follows then that for this additional reason the rejection of Claim 52 must be withdrawn.

With regard to Claim 96, it has been previously remarked that Frankenbach does not disclose independently determining intensity values. As such is recited in Claim 96, Frankenbach cannot be put forth to teach this limitation. It follows then that the combination suggested by the Examiner is improper and cannot be maintained as a basis of the rejection of Claim 96.

With regard to Claim 97, the Examiner states that Frankenbach discloses utilizing a desired intensity value and a previous frame intensity value at col. 3,

lines 13-55. Applicant respectfully asserts that no such disclosure is found at the cited location and requests clarification to allow a more thorough response.

Cooper in view of Szeliski and further in view of Aritake et al.

Claim 95 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper in view of Szeliski as applied to claim 92 above, and further in view of Aritake et al. (U.S. Patent 5,872,590, hereinafter "Aritake"). Applicant traverses.

The Examiner essentially states that Cooper and Szeliski disclose all of the features of Claim 95 except for the specific features recited in such dependent claims. Applicant DISAGREES. As Claim 95 depends from Claim 84, Applicant reasserts the remarks presented with respect to such claim that Cooper and Szeliski do not disclose all the features of such independent claim. It follows then that the combination of Cooper and Szeliski cannot disclose the features of Claim 95 derived from Claim 84 and that any rejection based on such an allegation is in error and must be withdrawn.

While Applicant agrees that Aritake discloses projecting an image for a right eye and a left eye of an observer, such is disclosed at col. 16, lines 43-63, the Examiner's reference to col. 10, lines 57-67 DOES NOT disclose using two cameras for producing images to be displayed. Rather such lines disclose using two cameras to determine the right and left eye positions of an observer so that the viewing apparatus can be adjusted. Hence Applicant requests clarification.

However, Applicant asserts, without admission, that even if Aritake were to provide such a disclosure, the combination of Aritake with Szeliski is without any motivation. Szeliski provides for constructing an image mosaic where such mosaic is useful in a virtual reality environment. To provide such a mosaic, Szeliski takes individual images and overlays them such that a seamless mosaic is formed which can give a viewer a 3D feel. As such, Applicant can see no advantage to such a combination as the 3D feel of Aritake is already present.

Cooper in view of Szeliski and Sporer and further in view of Aritake

Claim 71 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper in view of Szeliski and Sporer as applied to claim 67 above, and further in view of Aritake. Applicant traverses.

The Examiner essentially states that Cooper and Szeliski disclose all of the features of Claims 71 except for the specific features recited in such dependent claim. Applicant DISAGREES. As Claim 71 depends from Claim 50, Applicant reasserts the remarks presented with respect to such claim that Cooper and Szeliski do not disclose all the features of such independent claim. It follows then that the combination of Cooper and Szeliski cannot disclose the features of Claim 71 derived from Claim 50 and that any rejection based on such an allegation is in error and must be withdrawn. In addition, as Aritake is not put forth to overcome these deficiencies and as Aritake does NOT in fact overcome these deficiencies, Applicant asserts that the combination

of Szeliski, Sporer and Aritake does not meet the requirement for a rejection under §103 and such rejection must be withdrawn.

Cooper in view of Szeliski and Kitamura and further in view of Kazami et al.

Claim 73 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper in view of Szeliski and Kitamura as applied to Claim 72 above, and further in view of Kazami et al. (U.S. Patent 6,035,093, hereinafter "Kazami"). Applicant traverses.

The Examiner essentially states that Cooper, Szeliski and Kitamura disclose all of the features of Claim 73 except for the specific features recited in such dependent claim. Applicant DISAGREES. As Claim 73 depends from Claim 72 which in turn depends from Claim 50, Applicant reasserts the remarks presented with respect to such claims that Cooper and Szeliski and Cooper, Szeliski and Kitamura do not disclose all the features of Claims 50 and 72. It follows then that the combination of Cooper and Szeliski cannot disclose the features of Claim 73 derived from Claims 50 and 72, and that any rejection based on such an allegation is in error and must be withdrawn. In addition, as Kazami is not put forth to overcome these deficiencies and as Kazami does NOT in fact overcome these deficiencies, Applicant asserts that the combination of Cooper, Szeliski, Kitamura and Kazami does not meet the requirement for a rejection under §103 and such rejection must be withdrawn.

Summary

Finally, Applicant asserts that each of Claims 50, 76 and 84 recite in the preamble forming or using "video stream image data." As such Applicant asserts that such language is of patentable weight and must be considered by the Examiner in formulating a rejection. In each of the rejections responded to above, the Examiner does not seem to have afforded such language any consideration yet alone patentable weight as none of the cited references is directed to such video stream image data. For example, both Copper and Szeliski are directed to forming single images. In Cooper the single image formed is a rotated form of a first image, and in Szeliski the single image formed is an image mosaic. Each of the pending claims recites forming or using such video stream image data, directly or through dependency from Claims 50, 76 or 84. Therefore Applicant respectfully asserts that as none of the cited art discloses or even suggests such a feature, for this additional reason alone, none of the Examiner's rejections reach the necessary standard for a rejection under 35 U.S.C. §103 and must be withdrawn.

In summary, Applicant respectfully asserts that it has been shown that the rejections of each of Claims 50-97 should be withdrawn as such rejections do not meet the standard for rejection under §103 for the various reasons stated above. It follows then that each of such claims is in condition for allowance, which action is earnestly sought. However, in the event that the next Office Action is other than a Notice of Allowance, the Examiner is

respectfully requested to phone the undersigned at any time during normal business hours (Pacific Time Zone) to schedule a telephonic interview. Applicant respectfully requests that Examiner Peng attend such interview to facilitate resolution of any outstanding issues.

Respectfully submitted,

Dated: Sept 7, 2000

By: Bernard Berman

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